REMARKS

By this Amendment the specification has been amended to include topic headings and to reflect changes made to the drawings in the concurrently filed Letter Re Drawings, claim 1 has been amended to include the feature of claim 4 (now canceled), with the language modified to state that increasing lengths of the elements located adjacent one another has to prevent relative rotation, and claim 7 has been corrected. Entry is requested.

A supplemental page 26 for this application containing an abstract of the disclosure is submitted herewith.

In the outstanding Office Action the examiner has provisionally rejected claims 1 and 4-13 on the ground of non-statutory obviousness-type double patenting over claims 11, 12 and 14-20 in copending application Serial No. 10/482,773 in view of Carmichael et al.

In order to effectively address this rejection, a Terminal Disclaimer is submitted herewith.

The examiner has rejected claims 1 and 4-13 under 35 U.S.C. 102(b) as being anticipated by Carmichael et al., and he has stated that claims 2 and 3 contain allowable subject matter.

The applicants thank the examiner for his indication of allowable subject matter in claims 2 and 3; however, they assert that claim 1 as now amended defines novel and patentable subject matter, such that all the presented claims should now be allowed.

Carmichael discloses apparatus for circulating fluid in a borehole which includes a body member 2 having a throughbore 14 and a fluid port 3 extending through a side wall; a piston sleeve 12 movably mounted within the body member for movement between a closed position in which the piston sleeve closes off the fluid port and an open position in which the fluid port is permitted to communicate with the throughbore; and a seal housing 5 with a mounting member 6 and travel pin 7. A pressure differential means to generate a pressure differential across the piston sleeve is provided to move the sleeve from the closed position to the open position in use. An indexing mechanism couples the piston sleeve to the body member to permit the inner sleeve to be selectively moved between the closed position and the open position and to maintain the piston sleeve in one or the other position.

There is no disclosure or suggestion in Carmichael that the inter-engagement between support surfaces, which occurs when surface portions 19a of piston sleeve 12 abut surface portions 18b of seal housing 5 and surface portions 18a of seal housing 5 abut surface portions 19b of piston sleeve 12, operates to carry rotational load in the manner defined in claim 1 in a way which will reduce rotational load on the travel pin 7 and hence prevent excessive loading thereon. The interengagement of members 18 and 19 (Figure 2) is <u>solely</u> to transfer axial loading. When in their first operative position (in end abutment), the faces 19a contact with the faces 18a to transfer axial loading and thereby share the axial loading

with a pin, preventing overloading thereof. This happens when the pin 7 is in slot 17a. When the pin 7 moves into slot 17b, the "teeth on surface 19 (the teeth being the projecting bits that define the surfaces 19a) move into the "valleys" formed in 18a (the base of each valley being formed by surface 18b), but there is no disclosure in the Carmichael that the sloping flanks that connect surfaces 18a to 18b (i.e., the size of the valley) engage with the sloping "flanks" that connect surfaces 19a to 19b (i.e., the size of the teeth). As a result, there is no rotational load or torque transfer between members 18 and 19, and hence any rotational force which is applied between the two members when the pin is in slot 17b is carried only by the pin, giving rise to the risk of damage thereto. As is clearly shown in the drawings of Carmichael, in particular Figure 2, the length of the "teeth" formed on the surface 19 is narrower than the length of the corresponding "valley" 18b formed on the surface 18, and equally the width of the "valley" 19b formed on the surface 19 is greater than the width of the "teeth" 18a formed on the surface 18. Clearly, then, when these two parts are engaged, each "tooth" has play within the valley in which it engages, and therefore there can be no rotational load carried therebetween which would relieve the loading on the pin 7.

The only possible way in which any load could be carried between the two parts is if the system were configured such that, as the pin reaches the bottom of the slot 17b, the lower corner of one of the teeth is exactly vertically aligned with the lower corner of one of the valleys, so

that the subsequent wholly axial movement which could between the two surfaces as the pin travels up to its final position at the top of slot 17b brings, at the very end of that movement, the sloping surfaces into engagement. However, firstly this clearly cannot be the intended meaning of Carmichael, since the practical tolerances which would be required to achieve such exact interengagement would not be practically possible in the type of tool which is being dealt with. A slight misalignment either way would either result in the system locking up (if the surfaces came into contact too early, the inclined flanks would tend to try and rotate away from each other as the system were pressed further together, resulting in the exact opposition effect which is intended by the present invention - i.e., increasing load on the pin. If these are misaligned the other way, the surfaces would not come into contact at all so that, again, the solution of the present invention is completely missed in that all the load would again be carried between the pin and the slot). To clarify in relation to the issue raised by the examiner on page 6 of the communication, the "projections" referenced in the previous arguments are the teeth formed on the surfaces 18, 19 which have effectively have axial faces 18a and 19a.

Finally, even if the flanks did engage each other, which is strongly contested in light of the arguments presented above, because they are oblique, then they would develop a camming action between each other to force members 18a, 19a axially away from each other. Thus, the

potential would exist for the system to unlock itself upon application of rotational loading, something which is clearly not intended and this is further evidence that, in fact, engagement of the surface is certainly not implicit within the teaching of Carmichael. While it may be true to say that, in the citation, increasing the lengths of the elements overlap each other and therefore could be considered to locate adjacent one another, that does not provide resistance to relative rotation, in at least one direction, of the control member and the body. In Carmichael, the resistance to rotation in one direction is concerned with movement of the pin along the lower portions of the slot between points 17a and 17c, is achieved by geometrical configuration of the slot as already argued above. It does not prevent excess loading of the pin.

It is submitted that all the presented claims are allowable.

Respectfully submitted,

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